of groups. Oddly enough, on the other hand, group-theory assumes less preliminary knowledge than anything else except arithmetic, so that beginners, in a sense, start level, and have equal chances for a prize. Many of Prof. Burnside's examples, and, in particular, the notes at the end of the volume, are intended to suggest various lines of research.

It has already been observed that some of the matter of the first edition has been rearranged. The general effect has been to put more of the abstract theory in the earlier chapters; this will probably commend itself to experts, but will not make the book easier for beginners. They will probably find it convenient to pick and choose, and pay special attention to examples; they might begin by reading chaps. i.–v., vii.–ix., xviii.–xx., passing lightly over the more difficult parts; they must, in any case, become quite familiar with transformation, conjugate and self-conjugate operations and sub-groups, and the meaning of Hölder's symbol G/H. The great landmarks in the less advanced part of the theory are the properties of composition-series and their allies, together with Sylow's theorem and its consequences; these, at any rate, must be fully mastered before trying to advance.

The English student of group-theory is now fortunate in having at his disposal three excellent text-books in his own language: Mr. Hilton's "Finite Groups," which is a capital introduction to the subject, with plenty of easy examples; the present volume; and Prof. Dickson's "Linear Groups," which is particularly valuable for its completeness of detail, and its analysis of Galois fields. Our younger mathematicians are now fairly free from the shackles of ancient tradition, and we may confidently hope that some of them will add to our knowledge of this fascinating theory.

G. B. M.

A GUIDE-BOOK FOR INDIA.

A Handbook for Travellers in India, Burma, and Ceylon, including the Provinces of Bengal, Bombay, Madras, the United Provinces of Agra and Lucknow, the Panjab, Eastern Bengal and Assam, the North-West Frontier Province, Baluchistan, and the Central Provinces, and the Native States of Rajputana, Central India, Kashmir, Hyderabad, Mysore, &c. Eighth edition, with 80 maps and plans. Pp. cxvi+530. (London: J. Murray; Calcutta: Thacker, Spink, and Co., 1911.) Price 20*s.* net.

THE handbook to India, Burma, and Ceylon issued by Mr. John Murray, which now appears in its eighth edition, has reached its present form after a long series of revisions. It was first published between 1859 and 1883 in four volumes, and was the work of a well-known Oriental scholar, the late Captain E. B. Eastwick, who collected the material during several journeys to India. When we remember that in the period immediately following the Mutiny of 1857 communications throughout the Empire were imperfect, and that the present vast library of Indian books of reference, such as the imperial and provincial gazetteers, the census, archæological, and other departmental reports were not available for reference, Captain Eastwick's work was, in its way, admirable. Since the book appeared in its original form it has been subjected to constant revision by competent scholars, and has now been practically rewritten by Mr. H. C. Fanshawe, late secretary to the Government of the Panjab, and author of an excellent account of the imperial city of Delhi. The arrangement has been recast in accordance with the most recent railway developments, and the accounts of the most important places have been revised in the light of modern research.

The handbook in its present form thus furnishes a compendium of the most trustworthy information regarding the topography, races, antiquities, and modern history of the Empire. As might have been expected, there are in some places signs that the new material has been imperfectly assimilated with the old, and some errors, misprints, and omissions have escaped the attention of the latest editor. Thus, Sir Colin Campbell's force at the final relief of Lucknow, which consisted of seventeen battalions of infantry, twenty-nine squadrons of cavalry, and 134 guns, certainly aggregated more than 2000 men; the venerable error that the River Gumti, really the Gomati, "rich in cows," means "serpentine," should not have been repeated; the sportsman might have been warned that rifles carrying the army cartridges are rigidly excluded, and he should have been advised to supplement his Express rifle by a smaller bore, high-velocity weapon.

These, however, are trifling matters, and the introductory chapter which gives advice on expenses, clothing, food, sanitation, and camping represents the accumulated experience of many competent authorities, while the accounts of the great cities, their architecture and industries, the campaigns and battles, leave little to be desired. The maps and plans are numerous, and, as a rule, excellent. The present edition, while it will be indispensable to the tourist, will find a wider circle of readers among officers on Indian service and their friends at home who are interested in the country and its people. For ordinary people it will be a useful substitute for a collection of the more bulky books of reference, such as the imperial and provincial gazetteers and the departmental reports, which must be consulted by all serious students of the Indian Empire, its races, and their history.

ENGINEERING GEOLOGY.

Geology for Engineers. By Lieut.-Colonel R. F. Sorsbie, R.E. Pp. xxvii+423. (London: C. Griffin and Co., Ltd., 1911.) Price 10*s.* 6*d.* net.

ONE important engineering lesson from this book is the danger of working with unknown materials and of using unfamiliar terms. The book is a compilation, mainly from second-hand sources of information, half of which are out of date. The author has seldom discovered the recent original authorities. The work consists of two parts; the first 238 pages

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summarise the rudiments of general geology; the special subject of the book is confined to the second section of 160 pages.

The first part is unduly long, and is so inaccurate and out of date that engineering students will be well advised to learn the elements of geology from a more trustworthy text-book. The author's petrological knowledge may be illustrated by the following examples. "Peridotite.—A name used for a basalt or dolerite rich in olivine, chiefly noticeable on their [*sic*] alteration into serpentine" (p. 111). Clay (p. 114) is said to have "very nearly the same composition as the mineral felspar." The Silurian greywackes are included on p. 281 in the crystalline schists. Ooiite is described as composed of "egg-like granules." The definition of agglomerate omits the essential character of the size of the fragments. In the author's definition of conglomerate, puddingstone is based on the rounded form of the pebbles instead of on the induration of the rock. The trap-rocks are retained in reliance on authors who, in this respect, were conservative when they wrote in 1885. The table of rock characters on pp. 203 to 206 is useless and misleading.

The section on palæontology is better, as it is briefer; it is equally inaccurate. The author says that the Cœlenterata are characterised by "a distinct body-cavity," and he refers to Favosites, which he includes in the Hexacoralla, as having septa "in sixes." On an authority of 1889 he states (p. 153) that the Radiolaria "are rarely found fossil."

In the chapters on stratigraphy are included various tables of foreign formations. Those for Australia, New Zealand, and South Africa are quoted from Prestwich's "Geology" of 1886. They are only of historic value. The value of the information on British stratigraphy may be judged from the statement (p. 180) that the Calciferous sandstones are overlain by the Carboniferous limestone in the north of Scotland.

It may be claimed that the book should be judged by its second part, which is, however, no better than the first. It contains much useful information, but most of the authorities quoted are out of date, and inadequate knowledge of geology and geography has led the author into many mistakes. He assures us (pp 239–40) that in open and barren plains

> "the construction of railways influences the rainful [*sic*] to a very great extent. Instead of continuous drought all along the Pacific railroad, rain now falls in refreshing abundance."

The authority quoted for this extinct belief is Humber's "Water Supply of Cities and Towns," published in 1876. This book is the author's most oft-quoted source of information on matters connected with rainfall. The rate of deep-sea sedimentation is adopted, at second hand, from "the late Mr. Tylor" (p. 383), though a later authority on this question is elsewhere referred to (p. 23) as "Mr. Murray." The author often refers to himself as the authority for his statements, and amongst other criteria of doubtful geological value, which he advances as a result of his own observations, is that "snakes are common on light soils."

AN EASTERN HORSE-BOOK.

The Faras-Nāma-e Rangīn; or, the Book of the Horse. By "Rangīn." Translated from the Urdu by Lieut.-Colonel D. C. Phillott. Pp. xx+83. (London: Bernard Quaritch, 1911.) Price 10*s.* 6*d.* net.

The author of this treatise, who wrote under the *nom de plume* of "Rangīn," was, it appears, from the translator's introduction, one Sa'adat Yar Khan, whose birthplace was Delhi. After serving for some time in the cavalry of one or more of the native princes, he eventually became a recluse, during which period of his life he appears to have written the present and other works. He died in October, 1835. In the East the "Fars-Nāma" rapidly attained popularity, as is attested by the fact of its having passed through several editions; but we fear that the same good fortune is unlikely to attend the translation. Indeed, it is difficult to see to what class of readers it is likely to appeal in this country, although it is suggested by the translator that it may prove of service to officers of native cavalry in India. Personally, we should have thought a good English work on the management and disease of horses would have suited their purpose far better, except perhaps as regards native ideas of the "points" of a horse.

In the introduction, Colonel Phillott, after referring to the important part played by the horse in the history of civilisation in India, observes that no treatise on the subject would be complete without mention of the legends and myths connected with its origin. These differ markedly according as to whether they are derived from Moslem or Hindu sources, although, as is so often the case in similar matters in India, some of these show evident signs of a mixed origin. As "Rangīn" was a Moslem, he naturally wrote from the point of view of his own creed, and the translator has accordingly considered it desirable to give an account of the Hindu belief on this subject. As bearing on the origin of the classical myth of Pegasus, it is interesting to note that "according to Hindu legends, the horse was created a flying animal, one that could fly and run, and no man or God could snare it. Indra wanted horses for his chariots, and requested the sage Salihotra to deprive the horses of their wings. Accordingly Salihotra, by his *yoga* or supernatural power, derived by his austerities, accomplished Indra's wish." Deprived of their power of making long journeys in the air in search of medicinal herbs, the horses asked Salihotra to write a book on their diseases, which he did, and in time the Sanskrit name of the writer came to mean, first veterinary science, and then a horse. To this day native cavalry regiments have their *salotris.*

In connection with native horses, Colonel Phillott mentions that

> "Indian countrybreds will eat and thrive on food that would probably kill English horses. In the Persian Gulf and elsewhere locusts, fish, and dates are regarded as legitimate food for horses and cattle; in Tibet the *tanghans* [horses] are given pig's blood and raw liver; and in the cold regions of Central Asia meat is regarded as a necessity for horses."

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